



Marwyn and John's home pages

... where you will find details of some of the things that we want to make available to friends and family.

Main menu

- Home
- Holidays
- Sailing
- Music
- Family History
- Computers
- Astronomy
- Amateur Radio
- Contacts

Links

- Lothians Radio Society

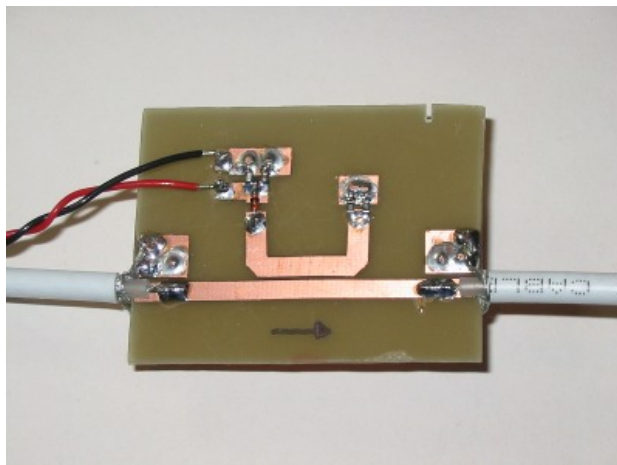
Navigation: [Home](#) > [Amateur Radio](#) > [Homebrew](#) > Directional coupler

John's homebrew pages

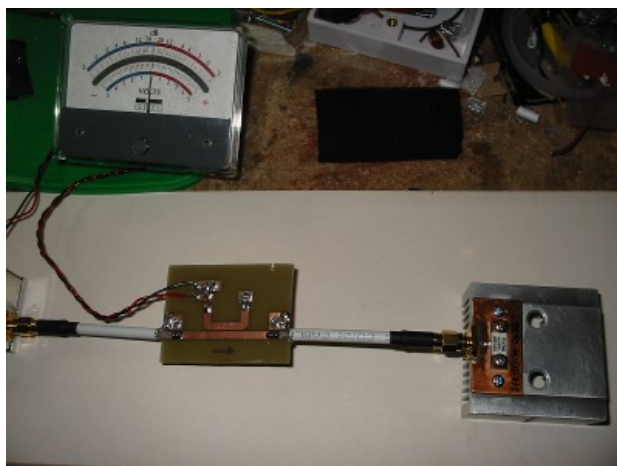
Microwave directional coupler - and an RF detector

More deviations from the main project.

I was concerned that, as I manage to generate a bit more power (hopefully!) at microwave frequencies, a simple RF probe would not be sufficient for power measurement, and the diode could be over-voltaged. A directional coupler allows a small amount of the forward signal to be sampled and measured. A very simple design is to use microstrip, as shown in the photo. A BAT85 Schottky diode is used as the detector, with 100pF and 10nF decoupling. The other end of the coupling loop is terminated with two 100 ohm resistors in parallel.



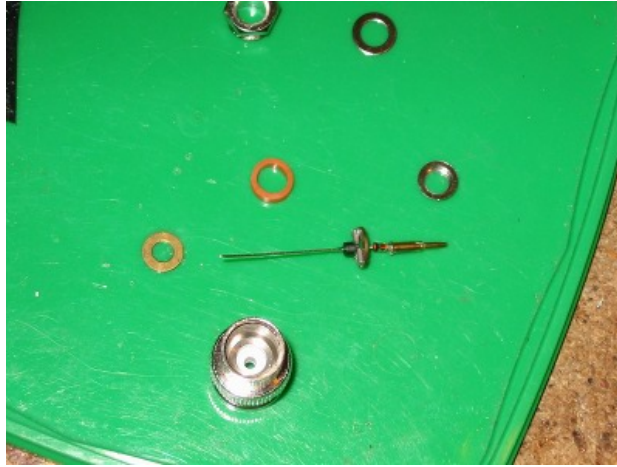
Here it is in use, with the signal being dissipated in the dummy load. A 100 microamp meter is used as the detector (100-0-100 microamps here since that's what I had available). It seems to work well, and is very directional indeed - very little signal is measured if it's connected the other way round. I don't know what the coupling is with any accuracy yet, but it will be fine for relative measurements for now.



Having proved its success, I will probably make one with forward and reverse detectors that can be put in a box and used as a "through line" power meter for forward and reverse measurements.

I also wanted something a bit more reliable than my hand held [RF probe](#) for making measurements of power in test rigs. With that, since it really needs to be mounted in a screened tube, the signal can vary a bit depending on how the probe is set up. I thought that if I could put the RF detector into a BNC plug, then I might get rather more consistent measurements. Here are the components before assembly into a BNC compression plug. The BAT85 diode fits right

down near the probe; two SMD 1nF capacitors are soldered to a brass washer, and to the other end of the diode, to give the decoupling; and for good measure, the output is taken through a 2mm ferrite bead. When I get round to scanning some circuit diagrams I'll try to remember to add a sketch of the arrangement here.



This new detector seems to be much more consistent than the RF probe, though I'm not yet happy that I can be sure of power measurements calculated from the detected DC voltage!

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